UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 3 0 2013

OFFICE OF
WATER

Ms. Miyoko Sakashita, Attorney
Center for Biological Diversity
351 California Street, Suite 600
San Francisco, California 94104

Dear Ms. Sakashita:

On behalf of the U.S. Environmental Protection Agency, thank you for your August 22, 2012, letter and Petition requesting that the Agency publish national water quality criteria recommendations pursuant to section 304(a)(1) to address plastic pollution, and publish information pursuant to section 304(a)(2) to guide states in monitoring and preventing harm to waters from plastic pollution. This letter responds to the Center for Biological Diversity's petition.

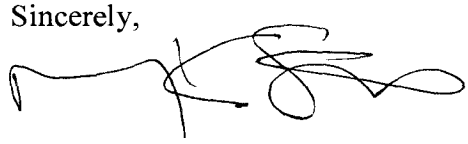
Your August 22, 2012, Petition requests that the Agency develop six different forms of recommended water quality criteria (WQC) for plastics for the protection of both the recreational use and protection of aquatic life and dependent wildlife under Clean Water Act section 304(a)(1). The Petition further requests that the EPA publish information pursuant to CWA section 304(a)(2) to guide states in monitoring and preventing harm to waters from plastic pollution. After careful consideration of these requests and supporting information, the EPA has decided not to exercise its discretion under CWA section 304(a)(1) to issue or revise water quality criteria recommendations for plastics at this time and hereby denies that first part of the Petition. However, as explained in the enclosed memorandum detailing the EPA's decision on the Petition for water quality criteria for plastic pollution, the EPA grants the request to prepare information relating to plastics pollution control under CWA 304(a)(2) because the Agency is expanding the scope of information it provides to the public about the threats and impacts of trash (including plastics) in the aquatic environment.

The EPA has long recognized that aquatic trash consisting of plastics and other materials is an important environmental issue for our oceans and coasts, causing economic, aesthetic, and ecological effects. The EPA believes that aquatic trash and debris is a potentially manageable problem that requires a much greater emphasis on the prevention and innovative management of trash and debris on land, *before* plastics present an environmental threat in aquatic systems. As part of our effort to support reducing trash in our nation's aquatic environments, the EPA has developed a new program called Trash Free Waters (TFW). The TFW program is designed with a strong emphasis on helping states, municipalities, businesses, and individuals reduce the volume of trash and debris that enters both freshwater and coastal ecosystems.

The EPA appreciates the opportunity to be able to present this important issue to the public. We expect that current and planned EPA actions and activities are and will be valuable in removing plastics pollution at the source, prior to it becoming an issue in marine waters. Thank you for your interest in the

EPA's water quality criteria program and efforts to address plastics pollution. If you have any questions regarding criteria development and plastics, please contact Joe Beaman at 202-566-0420 or beaman.joe@epa.gov in the Office of Science and Technology. If you have questions regarding the Trash Free Waters Program, please contact Robert Benson at 202-566-2954 or benson.robert@epa.gov in the Office of Wetlands, Oceans and Watersheds.

Sincerely,



Nancy K. Stoner
Acting Assistant Administrator

Enclosure

Memorandum Detailing The EPA's Decision on Center for Biological Diversity's Petition

for Water Quality Criteria for Plastic Pollution

Response Summary

The August 22, 2012, Petition requests that the Agency develop six different forms of recommended water quality criteria (WQC) for plastics for the protection of both the recreational use and protection of aquatic life and dependent wildlife under Clean Water Act (CWA) section 304(a)(1). The Petition further requests that the EPA publish information pursuant to CWA section 304(a)(2) to guide states in monitoring and preventing harm to waters from plastic pollution. After careful consideration of these requests and supporting information, the EPA has decided not to exercise its discretion under CWA section 304(a)(1) to issue or revise water quality criteria recommendations for plastics at this time and hereby denies that first part of the Petition due to a lack of supporting scientific information to justify specific quantitative thresholds to protect designated uses. As explained below, however, the EPA grants the request to prepare information relating to plastics pollution control under CWA 304(a)(2) because the Agency is expanding the scope of information it provides to the public about the threats and impacts of trash (including plastics) in the aquatic environment.

The EPA has long recognized that aquatic trash consisting of plastics and other materials is a pervasive problem for our oceans and coasts, causing economic, aesthetic, and ecological impacts (e.g., entanglements, unsightly beaches and loss of tourism, animal and human injuries, damaged property, greatly increased municipal clean-up costs). The Agency understands that trash and litter from land-based sources enters freshwater and coastal ecosystems and ultimately contributes to the enormous and ever growing volume of ocean trash, which poses risks to the marine habitat and may affect human health through the consumption of fish that have ingested large quantities of degraded plastics. The EPA also believes that aquatic trash and debris is a potentially manageable problem that requires a much greater emphasis on the prevention and innovative management of trash and debris on land, *before* plastics present an environmental threat in aquatic systems. As part of our effort to support reducing trash in our nation's aquatic environments, the EPA has developed a new program called Trash Free Waters (TFW). The TFW program is designed with a strong emphasis on helping states, municipalities, businesses, and individuals reduce the volume of trash and debris that enters both freshwater and coastal ecosystems.

Petition

The Petition requests that the EPA develop WQC to address plastic pollution in the ocean and coasts. Specifically, CBD explicitly requests six different forms of water quality criteria to protect against unacceptable levels of plastic:

1. Ocean and coastal waters shall be free of all visible plastic waste.
2. Zero discharge of plastic debris from stormwater or other outfalls.
3. Less than one item of plastic (>5 mm) per m^2 for ocean sediments, including beaches at or below the high tide line.

4. Less than one item of plastic (>5 mm) per m^3 in the water column.
5. Less than one item of microplastic (≤5 mm) per m^2 for sediments or m^3 in the water column and no more than one synthetic fiber per 50 mL sediment for subtidal sediments.
6. No visible plastic in the intestines or stomachs of marine biota, including marine mammals, sea turtles, and sea birds.

The Petition further asserts that "[b]ecause the latest scientific knowledge demonstrates that plastic seriously harms water quality, the EPA must develop criteria and information to specifically address plastic pollution." In several places the Petition urges the EPA to "promulgate" the requested actions, or otherwise to establish binding requirements.

Under CWA section 304(a)(2), the Petition further requests that the EPA publish new information providing guidance to the states on managing plastic pollution and inform the public of the special dangers that plastic pollution poses to the aquatic environment specifically regarding:

1. Threats of plastic pollution as described in the Petition;
2. Guidance on monitoring and measuring plastic pollution;
3. Best management practices for preventing plastic pollution; and
4. Establishing and implementing plastic TMDLs.

The first set of requests seeks the EPA action to recommend scientifically defensible thresholds to plastic pollution to protect human health and/or the environment pursuant to CWA section 304(a)(1). The second set of requests seeks the EPA action regarding publishing information pursuant to CWA section 304(a)(2) to guide states in monitoring and preventing harm to waters from plastic pollution. As detailed below, although the latest scientific knowledge does not support recommendations for specific numeric limits of plastic pollution, the EPA does agree that providing information to states, tribes, to stakeholders and the public relevant to managing plastic pollution should proceed expeditiously and that the EPA should support those efforts.

Statutory and Regulatory Background

The CWA establishes a comprehensive program "to restore and maintain the chemical, physical, and biological integrity of the nation's waters" (CWA section 101(a)). Wherever attainable, an interim goal of the CWA is to attain water quality that provides for the protection and propagation of fish, shellfish, and wildlife [CWA section 101(a)(2)]. The CWA establishes a policy to recognize, preserve, and protect the primary responsibility of states to prevent, reduce, and eliminate water pollution (CWA section 101(b)). States establish water quality standards, consisting of designated beneficial uses and water quality criteria to support and, if met, to protect such designated uses, as well as anti-degradation policies (CWA section 303(c)). The EPA supports state water quality standards programs through development and recommendation of water quality criteria, also referred to as 304(a) Guidance, to meet designated uses (CWA 304(a)(1)). Water quality criteria that states adopt may be in narrative and/or numeric formats, based on the EPA's 304(a) Guidance, modifications thereof, or other scientifically defensible methods, and based on biomonitoring methods or as supplements to numeric criteria, respectively (40 C.F.R. 131.11(b)).

The EPA Derivation of Recommended Water Quality Criteria

Water quality criteria are designed to protect designated uses. Criteria are elements of water quality standards, expressed as concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect designated uses (40 C.F.R. 131.3 (definition of criteria)). The EPA typically derives numeric criteria pursuant to CWA section 304(a)(1) to protect aquatic life from toxic chemicals in order to address both short-term (acute) and long-term (chronic) effects of such chemicals on aquatic life. The derivation of numerical national water quality criteria recommendations for the protection of aquatic organisms and the aquatic life uses is a complex process that relies on information from many areas of aquatic toxicology. For some forms of water pollution, and some instances where the designated uses are impaired in ways that are not directly characterized in terms of concentrations of a particular chemical, states sometimes develop a numeric translation of a narrative criterion. Sometimes, narrative criteria may not be amenable to numeric translation. Narrative criteria nonetheless provide the basis for protection against pollution for which the impact on designated uses cannot be precisely measured or where specific risk levels are best determined on a case-by-case basis.

State Use of the EPA's Recommended Water Quality Criteria Guidance

CWA section 304(a)(1) provides that the EPA shall develop (and from time to time thereafter, revise) water quality criteria based on the latest scientific knowledge regarding the relationship between pollutant concentrations and environmental and human health effects. As noted above, however, the EPA's recommended criteria -- the 304(a) Guidance -- do not impose legally binding requirements, nor do they automatically become part of a state or tribe's water quality standards. The EPA develops criteria based on the best available science, extensive scientific literature review, established procedures for effects assessment, EPA policy, external scientific peer review, where appropriate, and public input on potentially useful scientific information. States often rely on the EPA's 304(a) Guidance in deriving their own state criteria to protect their duly adopted designated uses. See U.S. EPA, Quality Criteria for Water ("Gold Book") 2 (1987) (explaining why CWA section 304(a) criteria are not rules and have no regulatory impact). Because the EPA's recommended criteria are not regulations, the EPA does not use rulemaking procedures to issue or revise 304(a) Guidance. By contrast, states use notice-and-comment procedures in the adoption of state-specific water quality criteria in their water quality standards.

Water quality criteria have no force of law under the CWA until they have been adopted into the particular state or tribe's water quality standards, the EPA has approved them, and they become suitable for use as a regulatory tool, for example, in the establishment of effluent limits in a wastewater discharge permit issued under the National Pollutant Discharge Elimination System, under CWA section 402.

Water Quality Standards

CWA section 303 directs states to adopt (subject to the EPA review and approval) water quality standards (WQS) to protect the nation's waters located within the state. The principal components of a state's WQS are: (a) designated uses for waters, such as water supply, recreation, aquatic life protection,

fish propagation, agriculture, and navigation; (b) water quality criteria, which define the amounts of pollutants the waters may contain without impairing their designated uses; and (c) antidegradation requirements, which protect existing uses and otherwise protect against degradation of waters. CWA sections 303(c)(2)(A) and 303(c)(2)(B), and 40 C.F.R. §§ 131.3(b), 131.3(f), 131.3(i), 131.6, 131.10-.I 1 (uses and criteria); and 40 C.F.R. § 131.12 (antidegradation). In certain instances, including after EPA disapproval of a state water quality standard or after the EPA determines that a new or revised water quality standard is necessary to meet CWA requirements, the EPA proposes and promulgates water quality standards (CWA section 303(c)(4); 40 C.F.R. 131.22 & Subpart D).

Ultimately, water quality criteria within WQS promulgated by a state (or by the EPA) provide a basis for assessing the degree of adverse effect of pollutants on attaining designated uses of our nation's waters and, if necessary, identify the pollutant reductions necessary to restore, protect and/or maintain the designated beneficial uses of those waters. As noted above, the EPA's regulations provide that states may adopt water quality criteria to protect designated uses by adopting criteria based on: (1) The EPA's CWA section 304(a) guidance; (2) CWA section 304(a) guidance modified to reflect site-specific conditions, or (3) other scientifically defensible methods. In addition, a state may establish narrative criteria where numeric criteria cannot be established or to supplement numeric criteria. 40 C.F.R. § 131.11(b)(2).

In instances where a water body segment is not attaining designated uses, CWA section 303(d) provides for the identification of such water body segments, as well as the identification of the causes for the impairment, and the establishment of a water pollution "budget" designed to restore the water body segment to attain its designated uses. The CWA describes this program as the "total maximum daily load" (TMDL) program and, as with the establishment of WQS, states and tribes assume primary responsibility for administration of TMDL programs subject to the EPA support and oversight.

The EPA's Assessment of Whether to Issue or Revise Water Quality Criteria Recommendations

The Petition requests that the EPA develop WQC recommendations for plastics pollution under section 304(a)(1) to reflect the latest scientific information. As explained below, the EPA has reviewed the information provided by petitioners and decided not to exercise its discretion under section 304(a)(1) to issue or revise WQC recommendations for plastics pollution at this time. To date, the EPA has not published 304(a) Guidance for plastic pollution; in many respects, the Agency's rationale that follows for its response to this Petition explains why the EPA has not done so previously. The EPA agrees that plastics do generally fall within the CWA's definition of "pollutant," which is defined broadly to include, among other things, solid waste, garbage, and industrial, municipal, and agricultural wastes discharged into water. CWA section 502(6). The following text outlines the reasons why the EPA has decided not to exercise its discretion under CWA section 304(a)(1) to issue or revise water quality criteria recommendations for plastics at this time and hereby denies that first part of the petition.

1) *There is Insufficient Scientific Justification for Specific Numeric Size and Occurrence Thresholds to Quantify the Adverse Impact on Designated Uses*

The EPA agrees that the information provided in the Petition indicates that plastics pollution impacts a variety of marine aquatic life and wildlife, as well as beneficial human uses such as fishing and bathing. Also, recent scientific research indicates that plastic may potentially play a role in the transfer of toxic

chemicals to aquatic organisms through leaching or desorption. However, the Agency does not believe that the information supports the Petition's requests that the EPA issue criterion recommendations in various forms that describe acceptable, quantifiable levels of pollution from undifferentiated forms of plastic. These forms of criteria are the third, fourth, and fifth forms of CWA section 304(a)(1) criteria recommendations requested in the Petition.

The EPA disagrees that the scientific information provided would support, for example, a WQC recommendation of "less than one item of plastic (>5 mm) per m^3 in the water column" or any other fixed unit of trash per unit matrix (whether sediment, beach, water), as an appropriate ambient threshold to protect aquatic life and human-associated beneficial uses.

Establishment of scientifically defensible numeric water quality criteria for specific plastic particle sizes would need to be based on quantitative dose-response information on the effects of plastic particles of various sizes and compositions to aquatic life and/or wildlife, and the identification of the threshold(s) at which effects and impairment could potentially be expected. The EPA does not believe it would be appropriate to develop such thresholds to express specific, numeric WQC recommendations without this quantitative information.

Furthermore, there is uncertainty surrounding the varying degrees of potential toxicity of various chemical compounds that might fall into the category loosely termed "plastics," as well as the varying effects of toxic chemicals that could potentially be found in or sorbed to items termed "plastics" on wildlife, for example, as noted in the Petition regarding impacts of microplastics on baleen whales (Petition, pg 19).

2) *Existing state narrative water quality criteria already provide some basis to protect the water column and aquatic life from plastics pollution.*

Despite the lack of rigorous analytic framework to quantify the impacts of plastic pollution, several states have interpreted the narrative criteria in their respective WQS as applicable to trash and other forms of debris, including plastics. Though the current state of the science is insufficient for the EPA to develop numeric nationally-applicable recommendations for plastics in 304(a) Guidance, or even to support recommendations for a non-zero numeric translation of narrative criteria, some state water quality programs have developed remedial water quality initiatives designed to accomplish a virtual elimination of trash, debris, or plastic in waters that are not attaining designated uses based on narrative water quality criteria. The Petition identifies these programs as "trash TMDLs." The current EPA-approved TMDLs for trash have each identified "zero trash" as the TMDL target. Trash TMDLs represent a relatively recent water quality management initiative by the states, and the EPA anticipates that lessons learned from implementation of "trash TMDLs" will lead to further improvements in reducing plastics pollution, including a heightened focus on reduction of pollution at the source, as well as control of unnecessary uses.

Given the technical limitations on the capacity of current science to provide the basis for a narrative 304(a) Guidance for plastics on a national basis, the EPA examined various states' narrative criteria that can be used to control unacceptable levels of plastic pollution. The EPA reviewed the water quality standards of all of the 50 states, the District of Columbia, five overseas territories, and five of the 39 Indian tribes with EPA-approved water quality standards (EPA, 2013 – Attachment 1). While there is a

great deal of variation between states in the language of narrative WQC, every jurisdiction has at least some language that could be interpreted to provide a basis to control trash, including plastics, that impairs designated uses. Several jurisdictions have more than one such narrative criterion. Briefly, the EPA's review indicates that:

- Most jurisdictions have narrative WQC that protect against floating debris or floating solids.
    - Example: Massachusetts. "All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances;... or produce undesirable or nuisance species of aquatic life."(314 CMR 4.05 (5))

- The narrative WQC of many jurisdictions use very broad language that would include the effects of plastic pollution, such as protection from nuisances, the impairment of designated uses, or harm to the natural community.
    - Example: Florida. "All surface waters of the State shall at all places and at all times be free from: (a) Domestic, industrial, agricultural, or other man-induced non-thermal components of discharges which, alone or in combination with other substances or in combination with other components of discharges (whether thermal or non-thermal): 1. Settle to form putrescent deposits or otherwise create a nuisance; or 2. Float as debris, scum, oil, or other matter in such amounts as to form nuisances; ... 6. Pose a serious danger to the public health, safety, or welfare." *(Florida Administrative Code, 62-302.500, effective May 4, 2007).*

- Some jurisdictions (e.g. Maine, Kansas, North Dakota, Nebraska, and Navajo Nation) have adopted narrative WQC that apply explicitly to trash, junk, refuse, or rubbish.
    - Example: Arizona. "A surface water shall not contain solid waste such as refuse, rubbish, demolition or construction debris, trash, garbage, motor vehicles, appliances, or tires." (*Arizona Administrative Code, R18-11-108)*

- In addition, most jurisdictions have narrative WQC that protect against toxic substances and would address toxics either absorbed to, or leached from plastics.
    - Example: New Jersey. "Toxic substances, general: None, either alone or in combination with other substances, in such concentrations as to affect humans or be detrimental to the natural aquatic biota, produce undesirable aquatic life, or which would render the waters unsuitable for the designated uses." (New Jersey Administrative Code, Title 7, 7:9B-1.14)

The Petition acknowledges that states have authority to address plastic trash in their current water *quality management* programs. The Petition recognizes that "states are using the CWA to address the plastic problem," (Petition pg 28) and highlights that several states (AK, HI, and CA) are "addressing plastic pollution in a holistic manner within the rubric of solid waste." Though the Petition requests a nationally applicable recommended criterion for plastics expressed categorically as "free from all visible plastic wastes," the EPA believes that the effectiveness of Trash TMDLs based on state narrative criteria may well render such a categorical criterion recommendation unnecessary.

3) A criterion for no visible intestinal plastics in aquatic life or marine wildlife would not be technically defensible

Although marine animals that ingest plastics may experience adverse effects including mortality from the presence of plastics in gastrointestinal tract, there is no clear evidence demonstrating that marine animals cannot incidentally ingest (and excrete) plastics without experiencing adverse effects. An effect on a marine organism from ingested plastics would be expected to be some function of the composition, size and shape of the plastic fragment, the number of fragments ingested by an animal, the size of the organism, the shape of the intestinal tract, the species-specific clearing processes for plastic fragments or particles, and the unit time depuration or clearance rate of the particles.

While monitoring of plastics effects on marine biota is crucial to assess the efficacy of current and future measures implemented to reduce the abundance of plastic debris, monitoring is complicated by large spatial and temporal heterogeneity in the amounts of plastic debris and by our limited understanding of the pathways followed by plastic debris and its long-term fate. In marine birds, for example, studies have shown that plastic loads in marine birds often reflect regional differences in the spatial abundance of marine debris (Day et al. 1985; Spear et al. 1995). The source of a plastic fragment, the foraging behavior of the species in question, and long distance migrations make it difficult to track the location of ingestion of plastic items (Ryan 2008).

Sea turtles readily consume plastic bags and other floating debris that appear similar to jellyfish, a preferred prey item (Balazs 1985, Bugoni et al. 2001, Bjorndal et al. 1994, and Tomas et al. 2002). Although ingestion of marine debris has been reported for all species of sea turtles that inhabit U.S. waters, sea turtles often occur within tropical and subtropical waters, with several species occurring circumtropically. Several species (e.g., juvenile green turtles, leatherbacks, and juvenile loggerheads,) spend at least a portion of their lives feeding within the pelagic convergence zones (e.g. Pacific Convergence Zone) on planktonic organisms (IAC, 2006) -- often in areas where floating plastic debris also accumulates. These zones are often far from coastal waters under state or territorial water quality standard jurisdiction.

In addition, predatory organisms, such as seals, sea lions, dolphins, porpoises and toothed whales may indirectly consume plastics through consumption of pelagic fish and other prey (Eriksson and Burton 2003), whereas baleen whales could be adversely affected through direct ingestion of plastics intermingled with zooplankton. Tracking the location and source of prey items that may have ingested plastic leading to a mortality event would be difficult if not impossible, but would be a necessary component for restoration or protection of a designated use in a WQC based on stomach contents of marine life. Additional complexity is added because carcasses from animals that have succumbed due to plastic ingestion are often carried great distances by currents or storms before discovery in coastal waters or on shore.

Thus, a "biocriterion" expressed as "no visible intestinal plastics in animal carcasses" (the sixth form of 304(a)(1) criterion requested) would not be scientifically defensible, particularly in light of uncertainty caused by migratory and foraging habits of marine animals, and the location of the plastic when it was ingested. Moreover, such a criterion would be difficult to implement by states due to the geographical restrictions on states' CWA authority in coastal marine waters (i.e., the three mile territorial sea) in light of these uncertainties as practical matter.

4) CWA section 304(a) does not authorize the EPA to establish effluent limitations, which are instead established in discharge permits under CWA section 402

The EPA is unclear regarding the precise nature of the Petition request that the Agency establish a zero plastic criterion for discharges for stormwater and other outfalls, but to the extent the second form of requested criterion is a directly enforceable restriction on discharges, the EPA denies the Petition's request that the Agency rely on CWA section 304(a)(1). As explained above, CWA section 304(a)(1) provides for the EPA issuance of water quality criteria recommendations, which states may then consider in developing water quality standards under CWA section 303(c). CWA section 304(a)(1) does not authorize the EPA to impose binding legal obligations or requirements. CWA section 304(a)(1) recommendations inform and support the development of criteria that support designated uses in water quality standards established under CWA section 303. Water quality standards are translated into enforceable obligations of dischargers through the issuance of National Pollutant Discharge Elimination System (NPDES) permits under CWA section 402. The Petition's request for a zero discharge of plastic debris requirement from stormwater and other outfalls effectively seeks effluent limitations in NPDES permits, which are outside the EPA's authority under CWA section 304(a)(1). As described in a preceding section, several states have indeed controlled plastics pollution (through translation of water quality standards into permit requirements) based on existing narrative WQS.

Related, Effective EPA and State Efforts to Reduce Trash

As the Petition notes, "EPA has approved or established 46 trash TMDLs for California waters." Allocations to point sources in these TMDLs under CWA section 303(d) have been translated into effluent limitations in storm water discharge permits under CWA section 402. Municipalities in the Los Angeles River basin are directed, through a Municipal Separate Storm Sewer System (MS4) permit, to achieve zero discharge of trash by 2016 in the form of approved trash control measures. The EPA has also approved trash TMDLs in Maryland and the District of Columbia. The State of Maryland recently added trash, debris, and floatables to its list of impairing substances for the Baltimore Harbor on its 2008 Integrated Report on Surface Water Quality, which reported on water quality impairments under CWA sections 303(d) and 305(b). The State has developed a draft TMDL, the public comment period has concluded, and the State is currently in the process of completing and adopting the TMDL.

Even apart from TMDLs, efforts are also under way in the San Francisco Bay Region, as well as the City and County of Honolulu (CCH), to reduce trash discharges directly through requirements in NPDES permits for those MS4s. Through implementation of the statutory standards for MS4 permitting at CWA section 402(p)(3)(B), including the requirement to control pollutants to the maximum extent practicable, these NPDES permits implement trash reduction requirements directly. The MS4 permits for the San Francisco Bay Region apply throughout five counties and 66 cities surrounding the Bay and require implementation of trash control measures with the ambitious goal of reducing trash loadings to zero by 2022.

The proposed NPDES permit for the CCH MS4 would require development and implementation of a trash control plan to reduce trash discharge to zero. The plan would establish a baseline of current trash discharges, describe control measures, target trash-impaired water bodies, integrate education efforts, and monitor progress toward reducing trash. The EPA's Region 9 is working with CCH and the Hawaii

Department of Health (HDOH) to finalize the permit. More information about the Region's work regarding the development and implementation of San Francisco and CCH trash control plans is available at *http://www.epa.gov/region9/marine-debris/pdf/marine-debris-strategy-2011.pdf*

The EPA's Assessment of Whether to Publish Information Regarding Plastic Pollution

The EPA is granting the portion of the Petition requesting that the Agency prepare information relating to plastics pollution control under CWA 304(a)(2). The EPA already provides extensive information related to aquatic trash and marine debris through web and published resources at both the national level (see http://water.epa.gov/type/oceb/marinedebris/index.cfm) and through regional programs (see http://www.epa.gov/region9/marine-debris/). These information resources will be expanded as the Agency's trash prevention and reduction programs continue to grow.

As noted above, the EPA has long recognized that aquatic trash (consisting of plastics and other materials) is a pervasive problem for our oceans and coasts, causing economic, aesthetic, and ecological impacts (e.g., entanglements, unsightly beaches and loss of tourism, animal and human injuries, damaged property, greatly increased municipal clean-up costs). The EPA also believes that aquatic trash and debris is a potentially manageable problem that requires a much greater emphasis on the prevention and innovative management of trash and debris on land, *before* plastics present an environmental *threat* in aquatic systems.

Based on these factors, the EPA is expanding its efforts to better understand and address the environmental and economic impacts of all trash (including plastics) in both freshwater and marine ecosystems. Given the land-based origins of the trash problem, the EPA has developed a new program called Trash Free Waters (TFW). The TFW program is designed with a strong emphasis on helping states, municipalities, businesses, and individuals reduce the volume of trash and debris that enters both freshwater and coastal ecosystems. The program has multiple elements, each of which addresses a factor that has been identified by external constituent groups as important to support public and private sector efforts to deal with trash more efficiently and cost-effectively. The actions taken will involve extensive dissemination by the EPA of both existing and new information.

The information provided by the EPA through the Trash Free Waters program and other ongoing activities to address marine debris will address plastic pollution as part of the broader focus on trash in aquatic environments. In so doing, the Agency will provide information that addresses the specific CBD petition requests: (1) plastic pollution threats (i.e., impacts), (2) monitoring and measurement protocols, (3) Best Management Practices (BMPs; and innovative new approaches to sustainable packaging) to reduce plastics loadings, and (4) guidance for state and municipal development of regulatory standards (TMDLs, but also stormwater standards, bag and bottle bills, etc.).

Plastic pollution threats and impacts

The TFW program has several elements that will help inform the public about the threats and impacts of trash (including plastics) in the aquatic environment. The EPA plans to develop credible national data on the cost impacts of trash in the aquatic environment – i.e., costs to municipalities, businesses, and individual taxpayers. The Agency also will rework its information and education strategies to create a much more compelling message to influence personal behaviors when it comes to littering and to change business

behaviors when it comes to refuse management. In addition, the TFW program will support the development of regional coastal strategies for trash prevention and reduction, building on the successful model in EPA Region 9. These regional strategies will include strong outreach and education components.

While these aspects of the TFW Program will address plastics as part of the larger aquatic trash problem, the EPA also will address plastics pollution specifically and directly in several areas. The Agency will sponsor a scientific review of studies conducted to date related to potential human health effects from eating fish tissue that has absorbed toxins from plastic particles in the ocean that the fish have ingested. As currently planned, an independent scientific organization will convene an expert panel to review existing and ongoing studies and offer their assessment of what credible scientific conclusions might be reached regarding health effects. The starting point for expert panel discussion will be a recent "white paper" that assesses the state of scientific study on the human health effects issue, authored by EPA scientist Richard Engler ("The Complex Interaction Between Marine Debris and Toxic Chemicals in the Ocean," R.E. Engler, *Environmental Science and Technology,* 46, 12302-12315).

The EPA also will conduct a concurrent analysis of the sources and effects of plastics pollution on aquatic life (i.e., non-human) and habitat, including marine wildlife, drawing upon many studies that have been done to date. As has been done with regard to potential human health effects, the Agency intends to develop a "white paper" that will analyze the "state of the science" regarding the environmental effects of plastics pollution on aquatic life and wildlife, including an assessment of toxic chemicals absorbed and/or released from plastics in the aquatic environment.

Together, these technical analyses will enable the public to more easily access detailed information available from the compendium of the latest information and data available from the peer-reviewed literature as well as specific gray literature sources. A bibliography style "clearinghouse" regarding effects related literature also will be maintained by the EPA and updated periodically.

Monitoring and measurement protocols

The development of credible environmental metrics for plastic pollution is inherent in much of the technical and strategic planning work described above. The EPA maintains that the results of its technical analyses will better inform the Agency, states, and other constituent groups about the level of impairment and the options available for them to reduce plastic pollution loadings. In addition, the TFW regional trash prevention and reduction strategies will involve extensive information sharing with state and municipal agencies, drawing upon the wealth of available resources on regulatory and non-regulatory options to reduce loadings.

Best Management Practices for plastics and sustainable packaging

At present, the EPA is not able to identify a single set of best practices for the manufacture of plastics or the design and utilization of plastic packaging. However, the Agency's solid waste management program sees great potential to leverage industry efficiency trends to greatly increase the recovery and reuse of plastics and packaging materials, and thereby greatly reduce the loadings of these materials into the aquatic environment. Therefore, the TFW program will explore new strategies for leading businesses and other stakeholders to pursue sustainable product and packaging goals that reflect the EPA's sustainability principles. These activities will include widespread sharing of non-proprietary information on innovative technologies, practices, product design, etc.

Guidance for state and municipal development of regulatory standards (TMDLs and other standards)

As noted above, the TFW program plan includes the development of regional strategies for trash prevention and reduction. Regional strategies will involve extensive information sharing with state and municipal agencies (and others) on available regulatory and non-regulatory tools and approaches that can be applied to address the unique circumstances and opportunities in a given geographic area. While there is considerable information available on the creation of trash TMDLs in Los Angeles and Washington DC, the EPA also will use the TFW program to share information on other regulatory approaches taken or contemplated, such as the use of stormwater MS4 permits to reduce trash loadings in San Francisco, or the use of plastic bag bans or bottle recovery programs in many municipalities.

An open process

As the collective set of TFW projects moves forward, in parallel with related work by other government agencies, municipalities, non-governmental organizations, academics, and business entities, the EPA will share information with the public through various means, including online and published resources. The Agency welcomes participation by CBD and all interested stakeholder groups in the design, implementation, and utilization of these projects. By maintaining an open process with extensive information sharing that addresses the plastics waste reduction goals that the EPA and CBD share, and by addressing key information and strategic planning needs to deal with plastics loadings pursuant to the EPA's authority under CWA Section 304(a)(2).

Conclusion

The EPA has long recognized that aquatic trash consisting of plastics and other materials is an important environmental issue for our oceans and coasts. The EPA believes that aquatic trash and debris is a potentially manageable problem that requires a much greater emphasis on the prevention and innovative management of trash and debris on land, *before* plastics present an environmental threat in aquatic systems.

As stated above, the EPA does not believe that the petition, and the current state of science, provides support for scientifically defensible numeric WQC recommendations specifying the number of items or particles of plastic per unit of measurement under CWA section 304(a)(1). Though numeric water quality criteria for plastics pollution in the forms recommended in the petition may focus public attention on plastics pollution, the EPA believes that other measures also can effectively raise public awareness. Development of numeric criteria for plastics remains premature based on currently available scientific information. Increased scientific understanding of the effects of specific plastic materials and pollutants potentially adsorbed to them would be useful to support a more quantitative understanding of the effects of plastics on aquatic life and the establishment of criteria to protect designated uses.

Existing narrative water quality standards adopted by states, territories and authorized tribes under CWA section 303 already have begun to focus public attention on the need to manage discharges of trash (including plastic pollution) to protect water quality, habitat, and wildlife from land-based sources. The EPA's comprehensive review (documented in Appendix 1, attached) of state, territorial and tribal

narrative WQS applicable to plastics pollution, and trash more generally, suggests that states should be able to move forward in the reduction of plastic pollution in marine waters without specific numeric recommendations.

The trash TMDLs that the EPA has approved were developed based on state interpretations of their respective narrative WQC where designated uses of waters are impaired by trash pollution. Trash pollution, as a gross measure, may or may not include plastics of one form or another. None of the TMDLs approved to date establishes threshold levels of acceptable amounts of trash pollution, but the acceptable level of trash pollution for the purposes of managing water quality impairments has effectively been set at zero in some areas. As noted above, for the EPA to recommend acceptable thresholds of undifferentiated "plastics" would be inconsistent with the purpose, and thus undermine the effectiveness, of such trash TMDLs.

Although the Agency is denying the request to develop numeric criteria for plastics under 304(a) (1) at this time, the EPA is preparing to develop and publish new information pursuant to CWA authority under 304(a)(2) that reflects the latest science on the ecotoxicology and other effects of plastic pollution in aquatic ecosystems through the development of the white paper described above.

Under CWA 304(a)(2), the EPA is addressing the plastics pollution problem through non-regulatory methods as described previously. The EPA's Trash Free Waters Program will be a significant tool for addressing plastics pollution through coordination and leveraging of local, state and national resources in concert with public-private partnerships to enable significant reductions in the volume of trash and plastics entering both freshwater and marine aquatic ecosystems.

The EPA appreciates the Center for Biological Diversity's concerns regarding the impacts of plastics pollution, and will publish the white paper in a timely matter, consistent with Agency peer review and procedural requirements. The Agency will also update communication materials for the public on the EPA activities related to this issue. Please contact me, or my staff, as noted above, should you have any additional questions.